

WHAT IS CLAIMED IS:

1. A composition comprising an avian leptin receptor binding domain having an amino acid sequence SEQ ID NO: 8 bound in a complex to a leptin protein.
2. The composition of claim 1, wherein the avian leptin receptor binding domain is chicken leptin receptor binding domain.
3. The composition of claim 1, wherein the leptin protein is mammalian leptin.
4. The composition of claim 3, wherein the mammalian leptin is selected from the group consisting of human, rat, mouse, ovine, porcine, and bovine leptin.
5. The composition of claim 3, wherein the avian leptin receptor binding domain is chicken leptin receptor binding domain and the mammalian leptin is human leptin.
6. A method for detecting a level of free leptin in a sample from an individual, comprising:
contacting the sample with an avian leptin receptor binding domain of SEQ ID NO:8 for a time sufficient to allow binding between the free leptin and the leptin receptor binding domain to form a bound complex, wherein said receptor binding domain is bound to a solid phase;
washing the solid phase with a first wash buffer;
contacting the solid phase with an antibody having binding specificity to leptin, wherein said antibody is coupled with a detectable label;
washing the solid phase with a second wash buffer; and
detecting said label remaining with said solid phase, thus detecting the level of free leptin in the sample.
7. The method of claim 6, wherein the avian leptin receptor binding domain is chicken leptin receptor binding domain.
8. The method of claim 6, wherein the individual is a mammal.

9. The method of claim 8, wherein said mammal is human, rat, mouse, ovine, porcine, or bovine.

10. The method of claim 6, wherein the sample is a human serum or plasma sample.

11. The method of claim 6, wherein the individual has a condition or a disease related to the level of free leptin in the sample.

12. The method of claim 6, wherein the solid phase is a micro-titre well plate.

13. The method of claim 6, wherein the detectable label is radiolabeled, chemiluminescent, electroluminescent, fluorescent, enzyme-labeled, or bioluminescent.

14. A kit for an assay of a level of free leptin in a sample from an individual, comprising:
an avian leptin receptor binding domain comprising SEQ ID No. 8, wherein said domain is bound to a solid phase;
an antibody having binding specificity for leptin; and
a detectable label coupled with the antibody, wherein the free leptin in the sample binds to the avian leptin receptor binding domain and the antibody binds to the free leptin, thus allowing specific detection of the free leptin in the sample.

15. The kit of claim 14, wherein the avian leptin receptor binding domain is chicken leptin receptor binding domain.

16. The kit of claim 14, wherein the individual is a mammal.

17. The kit of claim 14, wherein said mammal is human, rat, mouse, ovine, porcine, or bovine.

18. The kit of Claim 14, wherein the sample is a human serum or plasma sample.

19. The kit of Claim 14, wherein the solid phase is a micro-titre well plate.
20. The kit of Claim 14, wherein the detectable label is radiolabeled, chemiluminescent, electroluminescent, fluorescent, enzyme-labeled, or bioluminescent.
21. A method of assaying a test compound for agonist or antagonist activity for the composition of claim 1, comprising:
 - a) measuring a level of interaction between the avian leptin receptor binding domain and the mammalian leptin in the absence of the test compound;
 - b) measuring a level of interaction between the avian leptin receptor binding domain and the mammalian leptin in the presence of the test compound;wherein when the level measured in step b) is greater than the level in step a), the test compound has agonist activity, and wherein when the level measured in step b) is less than the level in step a), the test compound has antagonist activity.